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Signed this 11th day of January 2011

A handwritten signature in black ink, consisting of a stylized 'N' followed by a long, sweeping horizontal line.

N. T. SIMPKIN

Deputy Managing Director - UK Translation Division

For and on behalf of RWS Group Ltd

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(54) Title of the Design: Cover for microwave food  
packaging

(21) Utility Model Application No.: H2-84868

(22) Filing Date: August 10 1990

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(57) Claim

Cover for microwave food packaging, characterized by being constituted as a multilayer sheet comprising a resin film laminatedly formed on an under side surface of a fibre paper of desired air permeability as a barrier layer having an airflow blocking function that is diminished by steam heating, and an air-permeable sheet laminated on said resin film as a cover layer.

Brief Description of the Drawings

FIG. 1 is a cross-sectional view of one embodiment of the design; FIG. 2 and FIG. 3 are cross-sectional views of another embodiment of the design; and FIG. 4 is a cross-sectional view of an example of the prior art.

10 Cover, 11 Fibre paper, 12 Resin film, 13 Air-permeable sheet, 20 Container main body, 30 Soft packaging bag.

FIG. 1

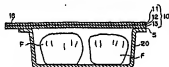


FIG. 2

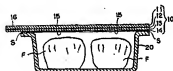


FIG. 3

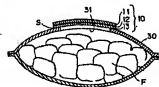
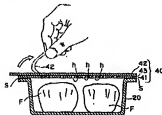


FIG. 4



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# SPECIFICATION

## 1. Title of the Design

Cover for microwave food packaging

## 5 2. Claim

1. Cover for microwave food packaging, characterized by being constituted as a multilayer sheet comprising a resin film laminatedly formed on an under side surface of a fibre paper of desired air permeability as a barrier layer having an airflow blocking function that is diminished by steam heating, and an air-permeable sheet laminated on said resin film as a cover layer.

## 3. Detailed Description of the Design

### 15 (Field of Industrial Utilization)

The present design relates to an improved cover for microwave food packaging.

(Prior Art)

An increase and diversification of the types and volumes of available microwave food products has occurred in recent times. Needless to say, many new designs and improvements in respect of the food packaging materials and the packaging modes thereof have accompanied this change.

25 While microwave food heat cooking modes differ according to the type and the nature and so on of the food product, in most of the microwave food heat cooking modes in circulation - which are designed with convenience and safety of handling and the use of the packaging container as a cooking container or a serving receptacle and so on in mind - the food is enclosed in a packaging container that is opened subsequent to heat cooking in a microwave.

35 When a food enclosed in a packaging container and heat cooked in this way contains a comparatively large quantity of moisture that necessitates the implementation of steam processing or the like in the heat process, a steam pressure regulating structure able to discharge the steam within the container to the

exterior as appropriate and in such a way that allows predetermined heat cooking to be implemented without the container being damaged and so on by the pressure of the steam generated in a large quantity from the food product is required.

FIG. 4 shows a conventional packaging with a steam pressure regulating function. This packaging mode, which constitutes a mode in which a cover (40) fabricated as a laminated sheet constituted from a film (41) in which steam discharge holes (h, h...) are dispersedly formed and a non-porous film (42) that closes these steam discharge holes bonded by way of an adhesive layer (43) is affixed (S) to the upper opening of a container main body (20) to seal the upper opening, is designed in such a way that, when the food product in the container is to be heat cooked, the upper-layer film (42) only of the cover (40) is peeled off and removed to expose the steam discharge holes (h, h...) of the lower-layer film (41), whereupon the steam generated from the food product (F) in the heat cooking process is discharged to the exterior through the steam discharge holes (h, h...).

(Problems to be Solved by the Design)

However, although the steam discharge holes (h, h...) formed in the cover (40) afford a reliable steam discharge effect and the interior steam pressure in the container is able to be regulated by increasing or decreasing the size and the number of these steam discharge holes, the aforementioned packaging is extremely inconvenient because of the trouble necessitated by the separation of the upper-layer film (42) of the cover (40) when heat cooking is performed by means of a microwave. In addition, should a user peel off the upper-layer film (42) but overlook the heat cooking instructions displayed on the upper surface of the container or, while aware of these instructions, forget to peel this layer off and subject the container to heat cooking, not only can this obstruct steam discharge and prevent the likelihood of

the food being cooked to the desirable state, it may result in damage and so on to the container caused by an abnormal rise in pressure within the container.

Notably, replacing the adhesive (43) between the  
5 film (41) having steam discharge holes and the upper-layer non-porous film (42) with a material whose adhesive action is lost or weakened due to steam heating, and separating the interface between the film (41) and the film (42) by means of the action of the  
10 heat and pressure of steam in the heat cooking process has been considered as a design for eliminating the inconvenience of removing the upper-layer film (42) and avoiding the trouble caused by forgetting to do the same; however, the reliable separation of the adhesive  
15 interface between the two films (41) and (42) by means of the action of the heat and pressure of steam has been found to be difficult and to lack reliability.

The present design resolves the aforementioned problems related to microwave food packaging.

20 (Means and Action for Resolving the Problems)

The cover for microwave food packaging according to the present design is characterized by being constituted as a multilayer sheet comprising a resin film laminatedly formed on an under side surface of a  
25 fibre paper of desired air permeability as a barrier layer having an airflow blocking function that is diminished by steam heating, and an air-permeable sheet laminated on said resin film as a cover layer.

The embodiments of the present design will be  
30 hereinafter described with reference to the drawings. In the drawings, constituent members identical to those shown in FIG. 4 are denoted by identical symbols.

FIG. 1 shows a cover (10) pertaining to this design, and an example of the employment of this cover  
35 (10) to seal the upper opening of a container main body (20) so as to produce a package.

The symbol (11) denotes a fibre paper formed as the top-side layer of the cover, (12) denotes a resin film formed as a barrier layer on the under surface

thereof, and (13) denotes an air-permeable sheet laminated on this resin film (12). The symbol (16) denotes a projecting piece that forms a hold to be used when the cover (10) is peeled off the container.

5       The fibre paper (11), which constitutes an air-permeable paper-like material having very fine gaps afforded by the interwoven structure of its constituent fibres, has a fixed air permeability that is dependent on the fibre packing density and paper thickness and so  
10 on. The steam generated from a food product and that fills the inside of the container in the heat cooking process of the food product in a microwave is discharged through the very fine gaps of the fibre paper (11) (12), to the exterior thereof.

15       Needless to say, the fibre paper (11) possesses the desired permeability, and is designed to be able to withstand contact with the steam in the heat cooking process, along with the action of the heat and pressure thereof. So-called synthetic fibres are effective fibre  
20 papers, and an example of a particularly suitable product is "Irebun" (product name, manufactured by Tokai Pulp and Paper Co., Ltd.). The air permeance of this fibre paper (JISP-8117, Oken method) is approximately 3 to 20 seconds, and this air  
25 permeability allows for the efficient discharge to the exterior of the steam generated within a container in the heat cooking process of a variety of food products.

      The resin layer (12) is fabricated as a layer of uniform thickness formed on the entire under surface of  
30 the fibre paper (11). The resin film (12) serves as an intermediate layer between the fibre paper (11) and the sheet (13) functioning both as a means for the bonded integration therebetween and as a barrier layer for blocking air and moisture from permeating the cover  
35 (10), and it fulfils the additional role of maintaining the packaging completely sealed state during the commercial distribution process of the packaging and preventing the degradation and deterioration of the food product until such time as the packaging is used



in heat cooking by the purchasing consumer. Softening and melting caused by contact with the steam generated by the food product in the heat cooking process of the food product in a microwave, along with action of the pressure exerted thereon at this time, causes the resin layer (12) to lose its uniform film form that allows it to function as the initial barrier layer, and this change in form affords communication between the gaps in the fibre paper (11) and the sheet (13) and allows steam to begin permeating/discharging from the interior of the container through to the exterior thereof.

The aforementioned resin film (12) is fabricated as a coated film either on the fibre paper (11) or the sheet (13), or by the pressed attachment of a membrane film thereon. The resin film material may be either a low-melting point resin or a hot water-soluble resin etc.; an example of the former are "Kanebo NSC low-melting point hot-melt resins (manufactured by Kanebo NSC Co., Ltd.), while an example of the latter is "Soafil" (manufactured by Mitsubishi Rayon Co. Ltd.), etc.

The sheet (13) covers the aforementioned resin film (12) and, in the food product heat cooking process, serves the dual role of supporting the resin film (12) which is softened and melted by the action of the steam, and preventing contact of the food product with the softened and melted resin. While a material identical to the material of the aforementioned fibre paper (11) or a porous film or the like may be used as appropriate as the sheet (13) material, in order to prevent a degradation of the air permeance of the fibre paper (11), it must possess an air permeance equivalent to or greater than the air permeance of the fibre paper (11). Depending on the selection of the material type thereof, the sheet (13) may serve the additional role as an adhesive for fixing the cover (10) on the opening of the container (20). An example of this type of sheet is "Unisel" (non-woven) (manufactured by Unisel Co. Ltd.).

The internal steam pressure, generated in the heat cooking process, of a food packaging employing the cover (10) of the present design can be heat-regulated in accordance with the type and the nature and so on of the food product by the selection of the air permeance of the fibre paper (11). In addition, the speed of the timing at which the change in the film surface mode of the resin film (12) caused by the steam heat occurs, that is to say, at which the transition from a continuous film surface form that functions as a layer for blocking air and moisture permeation to a form in which a loss of this barrier function occurs can be regulated by the thickness and so on of the film.

Notably, a structure for the cover (10) of this design has also been considered, in which a resin film (14) serving an additional role of an inner sealing layer or the like is laminatedly formed by printing or bonding or the like on the inner surface side as shown in FIG. 2. In this case, the resin film (14) is not provided across the entire surface of the fibre paper (11) and, naturally, in order to avoid the obstruction to steam discharge in the heat cooking process, an opening (15) must be provided to expose the upper surface of the fibre paper (11).

While the fabrication of a packaging employing the cover (10) of the present design in the example described above describes the use of the cover for an opening in the upper portion of the container (20), the present design is not limited thereto and, for example, as shown in FIG. 3, the application thereof as a structural member in a soft packaging in which a notched opening (31) is formed in one part of the packaging (30), and to which the cover (10) of this design is attached (S) to seal this opening (31) is also possible.

#### (Effect of the Design)

The microwave food packaging fabricated employing the cover of this design does not, unlike a conventional cover, necessitate the trouble of removing

an outer layer film and can be heat cooked in a microwave without alteration thereto and, in addition, not only is the annoyance inherent in the removal thereof eliminated, undesirable conditions associated  
5 with forgetting to remove this outer layer film (unpleasant heat cooked product outcome, damage to the packaging mode attributable to steam pressure and so on) are able to be avoided thereby. In addition, different from the cover of a structure that uses steam  
10 heat to separate a laminated adhesive interface between an outer layer film and an inner layer film, the reliability of the steam pressure regulating function of the microwave food packaging fabricated employing the cover of this design is excellent.

15 4. Brief Description of the Drawings

FIG. 1 is a cross-sectional view of one embodiment of the design; FIG. 2 and FIG. 3 are cross-sectional views of another embodiment of the design; and FIG. 4 is a cross-sectional view of an example of the prior  
20 art.

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FIG. 1

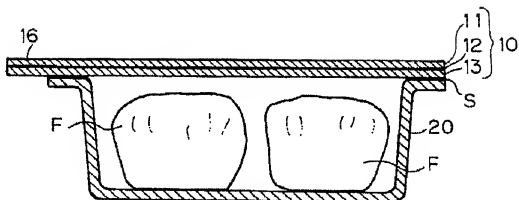


FIG. 2

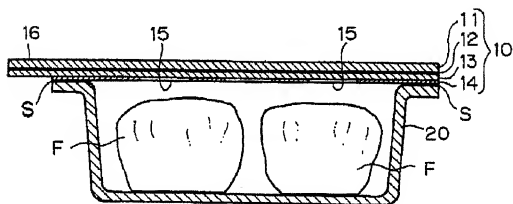


FIG. 3

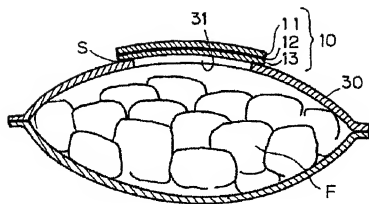


FIG. 4

